

## ABSTRACT OF THE DISCLOSURE

Methods and apparatuses are disclosed for implementing a processor with a split stack. In some embodiments, the processor includes a main stack and a micro-stack. The micro-stack preferably is implemented in the core of the processor, whereas the main stack may be implemented in areas that are external to the core of the processor. Operands are preferably provided to an arithmetic logic unit (ALU) by the micro-stack, and in the case of underflow (micro-stack empty), operands may be fetched from the main stack. Operands are written to the main stack during overflow (micro-stack full) or by explicit flushing of the micro-stack. By optimizing the size of the micro-stack, the number of operands fetched from the main stack may be reduced, and consequently the processor's power consumption may be reduced.